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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,848	02/09/2004	Haixin Yang	EL0542USNA	1063

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EXAMINER	
MCCLENDON, SANZA L	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
10/19/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-Legal.PRC@usa.dupont.com

Office Action Summary	Application No.	Applicant(s)	
	10/775,848	YANG, HAIXIN	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/24/07 has been entered.

2. All outstanding rejections are overcome by applicant's amendment filed 5/24/07.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-6 and 8-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 has been amended to recite that the conductive functional material has "maximum particle size of 5 μm". It is the examiner's position that this phrase fails to satisfy the

written description requirement under the cited statute since there does not appear to be a written description requirement of the cited in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163. Applicant has not pointed to any portion of the specification, and examiner has not found any support for this phraseology in the specification as originally filed.

There is no disclosure of "maximum particle size" in the specification as originally filed. It is noted that page 5, lines 31-33 of the present specification discloses that "D_{100} should not be larger than 5 microns". However, it is not clear what, if any, difference there is between D_{100} and "maximum particle size". Does D_{100} refer to maximum particle size? Clarification is requested.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 4-6, 8, 11-13, 15, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lent et al. (U.S. 5,837,042) in view of Sasaki et al. (U.S. 7,217,344) and Hirasa et al. (U.S. 2003/0166742).

Lent et al. disclose method for the deposition of an ink jet printable composition to substrate including plastic substrate comprising depositing ink onto the substrate using ink jet printing wherein the composition comprises 50-99% carrier that is aqueous and/or organic carrier wherein the organic carrier comprises alcohol such as ethanol, 1-15% polyvinyl pyrrolidone binder, and 0.1-2% pigment having average particle size of 0.2-2 microns wherein the pigment is rare earth metal, i.e. europium, chelate. It is well known, as disclosed by Sasaki et al. (col.5, line 56 and col.5, line 67-col.6, line 1), that rare earth metal chelates are conductive materials. Lent et al. also disclose that one or more binders are utilized wherein the binders include, in addition to polyvinyl pyrrolidone, polyacrylate. It is further disclosed that the ink possesses viscosity of 1.8-6 cP at 25 ^{0}C (col.4, lines 10-20, col.6, lines 11-14, 23-26, 30-32, and 43-49, col.7, lines 30-31 and 35, col.8, lines 32-33, col.9, lines 58-60, and col.11, lines 23-25).

The difference between Lent et al. and the present claimed invention is the requirement in the claims of the maximum particle size of the conductive material.

Hirasa et al., which is drawn to ink jet ink, disclose the use of pigment having maximum particle size of 5 microns in view of dispersion stability and stability of jetting performance (paragraph 56).

Given that Lent et al. in combination with Hirasa et al. disclose ink composition as presently claimed, it is clear that the ink would intrinsically maintain stability for 24 hours as presently claimed.

In light of the motivation for using pigment with specific maximum particle size disclosed by Hirasa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize the pigment or conductive material of Lent et al. with such maximum particle size in order to produce ink with good dispersion stability and stable jetting performance, and thereby arrive at the claimed invention.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lent et al. in view of Sasaki et al. and Hirasa et al. as applied to claims 1, 4-6, 8, 11-13, 15, and 17-18 above, and further in view of EP 1223201.

The difference between Lent et al. in view of Sasaki et al. and Hirasa et al. and the present claimed invention is the requirement in the claim of firing the ink and substrate.

EP 1223201, which is drawn to ink jet ink, discloses firing the ink and substrate after printing in order to fuse the ink to the substrate (paragraph 51).

In light of the motivation for firing the ink and substrate disclosed by EP 122301 as described above, it therefore would have been obvious to one of ordinary skill in the art to fire the ink and substrate in the process of Lent et al. in order to adhere the ink firmly to substrate, and thereby arrive at the claimed invention.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lent et al. in view of Sasaki et al. and Hirasa et al. as applied to claims 1, 4-6, 8, 11-13, 15, and 17-18 above, and further in view of Grant et al. (U.S. 6,555,205) or Kodas et al. (U.S. 2003/0175411).

The difference between Lent et al. in view of Sasaki et al. and Hirasa et al. and the present claimed invention is the requirement in the claim of treating the substrate in order to change its surface tension.

Grant et al., which is drawn to ink jet method, disclose pretreating substrate with surfactant in order to lower surface tension and thus reduce spreading of composition on substrate and enhance adhesion of coating to substrate (col.3, lines 50-58).

Alternatively, Kodas et al., which is drawn to ink jet method, disclose surface modification of substrate to increase adhesion and/or control spreading of composition printed thereon through modification of surface tension (paragraph 365).

In light of the motivation for treating substrate to modify surface tension disclosed by Grant et al. or Kodas et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to treat the substrate of Lent et al. in order to change the surface tension of the substrate and thus, increase adhesion of the ink to the substrate and control spreading of the ink on the substrate, and thereby arrive at the claimed invention.

9. Claims 1, 4-6, and 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Voeght et al. (U.S. 7,141,104) in view of Hirasa et al. (U.S. 2003/0166742), Shimura et al. (U.S. 4,942,056), and Roth (U.S. 5,889,084).

De Voeght et al. disclose method for the deposition of an ink jet printable composition to substrate including plastic substrate comprising depositing ink onto the substrate using ink jet printing wherein the water-based ink composition comprises 0.5-20% pigment that is carbon black, 0.1-10% polyvinyl pyrrolidone, monomer/oligomer such as trimethylolpropane triacrylate,

photoinitiator, polyacrylate, humectant such as ethylene glycol, and remainder water. It is disclosed that the pigment possesses average particle size of 0.005-1 μm (col.1, liens 15-16 and 20-22, col.6, lines 1-6, 15-26, and 54-55, col.14, lines 14-18 and 27, col.15, lines 7-9, and col.16, lines 60 and 63-67). It is well known, as disclosed by Shimura et al. (col.4, lines 1-3), that carbon black is a conductive material.

The difference between De Voeght et al. and the present claimed invention is the requirement in the claims of (a) the maximum particle size of the conductive material and (b) specific viscosity.

With respect to difference (a), Hirasa et al., which is drawn to ink jet ink, disclose the use of pigment having maximum particle size of 5 microns in view of dispersion stability and stability of jetting performance (paragraph 56).

In light of the motivation for using pigment with specific maximum particle size disclosed by Hirasa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize the carbon black of De Voeght et al. with such maximum particle size in order to produce ink with good dispersion stability and stable jetting performance, and thereby arrive at the claimed invention.

With respect to difference (b), while De Voeght et al. disclose that the viscosity of the ink is 20 mPa or less, there is no disclosure of the temperature at which the viscosity is measured.

On the one hand, given that De Voeght et al. in combination with Hirasa et al. disclose ink identical to that presently claimed and given that De Voeght et al. disclose that the ink has viscosity that overlaps that presently claimed, it is clear that the ink would inherently have viscosity at same temperature as presently claimed.

On the other hand, Roth, which is drawn to curable ink jet ink, discloses that such inks have viscosity of 1-25 cP at 25 ^{0}C to allow use within most conventional printers (col.12, lines 4-7).

Given that De Voeght et al. in combination with Hirasa et al. or in combination with Hirasa et al. and Roth disclose ink composition as presently claimed, it is clear that the ink would intrinsically maintain stability for 24 hours as presently claimed.

In light of the motivation for using ink with specific viscosity disclosed by Roth as described above, it therefore would have been obvious to one of ordinary skill in the art that the viscosity of De Voeght et al. is measured art 25 ^{0}C in order that the ink is suitable for use in ink jet printer, and thereby arrive at the claimed invention.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Voeght et al. in view of Hirasa et al., Shimura et al., and Roth as applied to claims 1, 4-6, and 8-17 above, and further in view of EP 1223201.

The difference between De Voeght et al. in view of Hirasa et al., Shimura et al., and Roth and the present claimed invention is the requirement in the claim of firing the ink and substrate.

EP 1223201, which is drawn to ink jet ink, discloses firing the ink and substrate after printing in order to fuse the ink to the substrate (paragraph 51).

In light of the motivation for firing the ink and substrate disclosed by EP 122301 as described above, it therefore would have been obvious to one of ordinary skill in the art to fire the ink and substrate in the process of De Voeght et al. in order to adhere the ink firmly to substrate, and thereby arrive at the claimed invention.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Voeght et al. in view of Hirasa et al., Shimura et al., and Roth as applied to claims 1, 4-6, and 8-17 above, and further in view of Grant et al. (U.S. 6,555,205) or Kodas et al. (U.S. 2003/0175411).

The difference between De Voeght et al. in view of Hirasa et al., Shimura et al., and Roth and the present claimed invention is the requirement in the claim of treating the substrate in order to change its surface tension.

Grant et al., which is drawn to ink jet method, disclose pretreating substrate with surfactant in order to lower surface tension and thus reduce spreading of composition on substrate and enhance adhesion of coating to substrate (col.3, lines 50-58).

Alternatively, Kodas et al., which is drawn to ink jet method, disclose surface modification of substrate to increase adhesion and/or control spreading of composition printed thereon through modification of surface tension (paragraph 365).

In light of the motivation for treating substrate to modify surface tension disclosed by Grant et al. or Kodas et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to treat the substrate of De Voeght et al. in order to change the surface tension of the substrate and thus, increase adhesion of the ink to the substrate and control spreading of the ink on the substrate, and thereby arrive at the claimed invention.

12. Claims 1, 4-6, 8, 11-13, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. (U.S. 2003/0166742) in view of Valentini et al. (U.S. 2005-0020730) and Shimura et al. (U.S. 4,942,056).

Hirasa et al. disclose method for depositing ink onto substrate including plastic substrate comprising depositing the ink onto substrate using ink jet printing wherein the water-based ink comprises 1-10% pigment that is carbon black, 8-100%, based on amount of pigment, copolymer obtained from vinyl pyrrolidone, dispersion liquid obtained from water and organic solvent such as ethylene glycol or alcohol, and other polymer obtained from (meth)acrylate. The carbon black possesses average particle size of 0.01-0.3 μm and maximum particle size of not more than 5 μm (paragraphs 9, 19, 23 (line 9), 46-47, 56, 61 (lines 11-14), and 84). It is well known, as disclosed by Shimura et al. (col.4, lines 1-3), that carbon black is a conductive material.

The difference between Hirasa et al. and the present claimed invention is the requirement in the claims of the viscosity of the ink.

Valentini et al., which is drawn to ink jet ink, disclose that jet velocity, separation length of droplets, drop size, and stream stability of ink are directly affected by viscosity of the ink and that pigmented ink jet inks typically possesses viscosity as high as 30 cP at 25 ^{0}C (paragraph 60).

Given that Hirasa et al. in combination with Valentini et al. disclose ink composition as presently claimed, it is clear that the ink would intrinsically maintain stability for 24 hours as presently claimed.

In light of the motivation for using ink jet ink with specific viscosity disclosed by Valentini et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize ink in Hirasa et al. with such viscosity, including that presently claimed, in order to produce ink that is suitable for, and effective in, ink jet printing and thereby arrive at the claimed invention.

13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Valentini et al. and Shimura et al. as applied to claims 1, 4-6, 8, 11-13, 15, and 17 above, and further in view of EP 1223201.

The difference between Hirasa et al. in view of Valentini et al. and Shimura et al. and the present claimed invention is the requirement in the claim of firing the ink and substrate.

EP 1223201, which is drawn to ink jet ink, discloses firing the ink and substrate after printing in order to fuse the ink to the substrate (paragraph 51).

In light of the motivation for firing the ink and substrate disclosed by EP 122301 as described above, it therefore would have been obvious to one of ordinary skill in the art to fire the ink and substrate in the process of Hirasa et al. in order to adhere the ink firmly to substrate, and thereby arrive at the claimed invention.

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Valentini et al. and Shimura et al. as applied to claims1, 4-6, 8, 11-13, 15, and 17 above, and further in view of Grant et al. (U.S. 6,555,205) or Kodas et al. (U.S. 2003/0175411).

The difference between Hirasa et al. in view of Valentini et al. and Shimura et al. and the present claimed invention is the requirement in the claim of treating the substrate in order to change its surface tension.

Grant et al., which is drawn to ink jet method, disclose pretreating substrate with surfactant in order to lower surface tension and thus reduce spreading of composition on substrate and enhance adhesion of coating to substrate (col.3, lines 50-58).

Alternatively, Kodas et al., which is drawn to ink jet method, disclose surface modification of substrate to increase adhesion and/or control spreading of composition printed thereon through modification of surface tension (paragraph 365).

In light of the motivation for treating substrate to modify surface tension disclosed by Grant et al. or Kodas et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to treat the substrate of Hirasa et al. in order to change the surface tension of the substrate and thus, increase adhesion of the ink to the substrate and control spreading of the ink on the substrate, and thereby arrive at the claimed invention.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Callie E. Shosho
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CS
8/4/07